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10/625,386

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Sundeeep Chauhan

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David K. Lucente  
Seagate Technology LLC  
Intellectual Property - COL2LGL  
389 Disc Drive  
Longmont, CO 80503

EXAMINER

NGUYEN, HAI L

ART UNIT

PAPER NUMBER

2816

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/625,386

Applicant(s)

CHAUHAN, SUNDEEP

Examiner

Hai L. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-18, 20-22, 25, 26 is/are rejected.
- 7) ☒ Claim(s) 9, 19, 23 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 23 July 2003
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 9 and 19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The field-programmable gate array on the single monolithic integrated circuit limitations of claims 9 and 19 do not further define the phase/frequency comparator apparatus limitation of claim 8 and the phase locked loop limitation of claim 18. Claims 9 and 19 are seem to be broader than the scope of claims 8 and 18, because they includes "a field-programmable gate array" in addition to the phase/frequency comparator apparatus of claim 8 and the phase locked loop of claim 18. It appears that claims 9 and 19 define a separate embodiment of the present invention and should be written in independent form.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3-7 and 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 3-6 and 12-15 are rejected, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the phase difference calculator (308 in instant

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Fig.3). In order for the accumulator (306) adds the numerical phase difference value (output of 306) to a value stored in the accumulator to obtain an accumulated phase error (311), the phase difference calculator needs to be included in the claim. Furthermore, claims 12-15 are similarly rejected, note the above discussion with regard to claims 3-6.

5. Claim 7 recites the limitation "the controlled oscillator " in line 1. There is insufficient antecedent basis for this limitation in the claim. Furthermore, the claimed limitation "wherein the controlled oscillator is a numerically controlled oscillator" is unclear because it cannot be determined what is being claimed here. Since there is no structural cooperative relationships of this element with the phase/frequency comparator apparatus recited in claim 1.

6. Claim 21-22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: calculating the phase difference (308 in instant Fig.3); note the above discussion with regard to claims 3-6.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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8. Claims 1, 2, 10, 11, 16, 17, 20, 25, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Staszewski et al. (US 6,429,693).

With regard to claims 1 and 20, Staszewski et al. discloses in Figs. 5&8 a phase/frequency comparator apparatus (804), and a method of use thereof, wherein the phase/frequency comparator includes a phase detecting stage that generates a result ( $Q(0)$ - $Q(L-1)$ ) that represents an instantaneous phase difference; and encoding circuitry (EDGE DETECTOR) coupled to the phase detecting stage; wherein the encoding circuitry converts a result of the phase detecting stage into a numerical phase difference value.

With regard to claim 2, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value.

With regard to claim 10, Staszewski et al. discloses in Figs. 5&8 a phase locked loop comprising a controlled oscillator (NCO); and a phase/frequency comparator (804), wherein the phase/frequency comparator includes a phase detecting stage that generates a result ( $Q(0)$ - $Q(L-1)$ ) that represents an instantaneous phase difference; and encoding circuitry (EDGE DETECTOR) coupled to the phase detecting stage; wherein the encoding circuitry converts a result of the phase detecting stage into a numerical phase difference value.

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With regard to claim 11, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value.

With regard to claims 16 and 17, the references also meet the recited limitations in these claims.

With regard to claims 25 and 26, controlling an output frequency (RF OUT) of an oscillator (103) using the result of the phase comparison, wherein the first signal (CKV) is an output of the oscillator (RF OUT through 106).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 8, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staszewski et al. in view of Brachmann et al. (US 6,351,154).

With regard to claim 8, the above discussed the apparatus of Staszewski et al. meets all of the claimed limitations except that Staszewski et al. does not disclose the apparatus is fabricated on a single monolithic integrated circuit. Brachmann et al. teaches

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in Fig.5 a similar apparatus can be implemented as integrated circuit (column 4, lines 20-33) as recited in the claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to implement that teaching with the apparatus of Brachmann et al. for the advantage of reducing additional cost when implemented within other circuits, e.g. ASIC, PLD, FPGA, PLL etc.

Claim 18 is rejected for similar motivation; note the above discussion with regard to claim 8.

#### *Allowable Subject Matter*

11. Claims 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not disclose or suggest a method of use thereof, as recited in claim 23, comprising the step of detecting a location of an edge in the snapshot of the first signal (304 in instant Fig.3); and mapping the location into a weighted numerical value (304 in instant Fig.3).

#### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. For example, Tomita (US 5,121,070) is cited as of interest because it discloses a phase demodulator for PSK-modulated signals circuit.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai L. Nguyen whose telephone number is 571-272-1747

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and Right Fax number is 571-273-1747. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The official fax phone number for the organization where this application or proceeding is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

HLN   
June 22, 2004

  
TIMOTHY P. CALLAHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800